

**U.S. Environmental Protection Agency
Science Advisory Board
Ecological Processes and Effects Committee Augmented for Review of the Ecological
Assessment Action Plan**

Summary Minutes

Date and Time: February 23, 2012, 12:00 – 4:00 p.m. (Eastern Time)

Location: By teleconference

Purpose: The purpose of the teleconference was to review and provide advice on the draft EPA document, *Integrating Ecological Assessment and Decision-Making at EPA: 2011 RAF Ecological Assessment Action Plan* (August 11, 2010)

Attendance:

Members of the EPA Science Advisory Board (SAB) Ecological Processes and Effects Committee Augmented for Review of the Ecological Assessment Action Plan:

Dr. Ernest F. Benfield
Dr. Gregory Biddinger
Dr. G. Allen Burton
Dr. Peter Chapman
Dr. Loveday Conquest
Dr. Richard Di Giulio
Dr. Robert Diaz
Dr. Lucinda Johnson
Dr. Thomas W. La Point
Dr. Wayne Landis
Dr. Judith L. Meyer
Dr. Amanda Rodewald
Dr. William Stubblefield

SAB Staff:

Thomas Armitage, Designated Federal Officer

EPA Representatives (EPA staff who requested access to the teleconference):

Mace Barron, Office of Research and Development
Betsy Behl, Office of Water
Diane Henshel, Office of the Science Advisor

Ronald Landy, Office of Research and Development
Lawrence Martin, Office of the Science Advisor
Michael McDonald, Office of Research and Development
Chuck Noss, Office of Research and Development
Edward Ohanian, Office of Water
Mary Reiley, Office of Water
Glenn Suter, Office of Research and Development

Public (individuals who requested access to the teleconference):

Anne Fairbrother, Exponent
Maria Hegstad, Risk Policy Report
Alexandra Reyes, CQ Transcriptions
Randall Wentsel, Exponent
Linda Wilson, New York State Office of the Attorney General

Teleconference Summary:

Convene the meeting

Dr. Thomas Armitage, Designated Federal Officer (DFO) for the Ecological Processes and Effects Committee, convened the teleconference at 12:00 p.m. Eastern Time. As noted on the agenda, the teleconference was Day 2 of a two-day meeting to review the Ecological Assessment Action Plan developed by EPA's Risk Assessment Forum (RAF). Dr. Armitage stated that the Committee was meeting by teleconference to continue its review the Ecological Assessment Action Plan and he identified the Committee members who were on the call. He stated that the Committee Chair, Dr. Ingrid Burke, was unable to be on the call and that Dr. Judith Meyer would serve as acting Chair for the teleconference. Dr. Armitage then stated that all of the meeting materials were available on the SAB web site (these materials included: the Federal Register Notice announcing the teleconference¹, teleconference agenda², charge to the Committee³ EPA review documents⁴, EPA provided background material⁵, EPA briefing material⁶, preliminary comments from Committee members⁷, and written public comments received⁸).

Panel Discussion

Dr. Meyer indicated that on the teleconference the Committee would discuss the responses to charge questions 2 through 7. She then opened the discussion of the response to charge question 2.

Discussion of the response to charge question #2

The Committee discussed the response to charge question 2, which focused on how an integrated approach to ecological assessments could contribute to better decision-making. Members commented on EPA's proposed approach to developing an integrated framework for ecological assessments. Members indicated that EPA had developed a good preliminary framework for

integrated ecological assessment and noted that it should be developed in more detail. A number of issues were discussed in this regard.

Members commented that the framework should include an approach to considering different lines of evidence. They noted that it would be helpful for EPA to identify endpoints to be considered in the integrated assessment approach. Members commented that in the integrated assessment approach EPA should consider multiple stressors, multiple endpoints, and cumulative risks. They suggested that adaptive management could be part of the integrated assessment framework. They also indicated that it would be useful to develop guidance and case studies to illustrate how the framework should be implemented.

A member commented that in some cases models and data were not likely to be available to implement the framework. He also noted that EPA should exercise caution when using indices in risk assessments. Other members emphasized that spatial and temporal variability should be considered when implementing the framework, and that use of the adverse outcome pathway approach should be considered. A member commented that it was important to consider ecosystem dynamics and apply appropriate time scales when conducting ecological risk assessments.

The Committee discussed the importance of considering climate change in the integrated ecological risk assessment framework. One member cautioned against too much emphasis on climate change, noting that it could distract EPA from immediate environmental protection needs. Other members disagreed, stating that consideration of the effects of climate change was very important in conducting ecological risk assessments.

The Committee also discussed the importance of coordinating risk assessment activities among various federal agencies. Members noted that it was important for federal agencies to share data. Other members commented on the importance of including a social science component in the integrated ecological risk assessment framework.

The Chair thanked the members and indicated that the discussion had been productive. She noted that some of the points discussed had also been covered in the discussion of the response to charge question 1. She indicated that there would be some redundancy in the Committee's report because charge questions were closely related. She then called for the discussion of charge question 3.

Discussion of the response to charge question #3

The Committee discussed the response to charge question 3, which focused on the merit of using a weight-of-evidence approach in ecological risk assessment, and how such an approach could be developed.

Members commented that the weight-of-evidence approach had scientific merit and that further guidance was needed to implement the approach. Members discussed the need to use quantitative methods, rather than best professional judgment, for considering multiple lines of evidence. Members commented that it would be useful to develop case studies illustrating the

use of a statistically-based weight-of-evidence approach. Members further commented that it was important to develop case studies using both data rich and data-poor examples.

The Committee discussed the use of Bayesian approaches. Members commented that Bayesian approaches should be emphasized as part of the weight-of-evidence approach.

Members offered further comments on the importance of using a weight-of evidence approach. They noted that in the past there was reluctance to use this approach because it was viewed as subjective. Committee members reiterated the need to move beyond the use of best professional judgment to quantitative methods.

The Chair thanked the members for the discussion of the response to charge question 3 and called for discussion of charge question 4.

Discussion of the response to charge question #4

The Committee discussed the response to charge question 4, which focused on actions to be taken to improve the communication of ecological assessment results to decision makers.

Members commented that the Committee had been asked to review a communication project plan that had been developed by the Risk Assessment Forum. The proposed plan called for completion of a survey that would be used to develop guidance for improved risk communication. Committee members expressed general agreement with the need for action to improve communication of ecological risk assessment results. However, members noted that EPA's description of the proposed project provided insufficient detail to determine whether it would meet the Agency's goals. Members also commented that the scope of the proposed project was quite narrow (i.e., it did not involve the full range of participants in the risk assessment-risk management process). Several members suggested that the scope of the proposed project be expanded to consider how to improve communication at all steps of the process, not just the handoff from risk assessor to risk manager.

A member noted that EPA's approach of using a survey to develop guidance was quite general and he suggested that the Agency pursue a more aggressive strategy. He suggested that EPA start with the risk management decision and then call upon a team to deconstruct and analyze the decision process and determine how communication could be improved. The member suggested that EPA could develop a template or protocol that could be a practical tool to improve risk communication.

Other members agreed with this suggested approach. They noted that EPA's proposed project appeared to be somewhat one-directional and also commented that communication needed to be improved at the problem formulation stage. Members also suggested that EPA take advantage of the results of a survey conducted by the Science Advisory Board to investigate how to improve the integration of science into EPA decision-making.

Committee members further commented on the need to take advantage of expertise in the social sciences to develop and implement guidance for improved risk communication. A member

commented that including ecosystem services endpoints in ecological risk assessments was a good way to frame the assessments for different target audiences. The member commented that ecosystem services flows were important to a range of decision-makers and other stakeholders.

The Chair then thanked the members for their discussion of charge question 4 and called for the discussion of the response to charge question 5.

Discussion of the response to charge question #5

The Committee discussed the response to charge question 5, which focused on actions to be taken to incorporate ecosystem services endpoints into ecological risk assessment methods. The Chair noted that the Committee had been asked to review the plan for EPA's a proposed project to incorporate ecosystem services endpoints into ecological risk assessments. She commented that the project called for development of a white paper and revision of EPA's Generic Ecological Assessment Endpoints Guidance. Several members noted that this appeared to be a good way to proceed, but the project plan lacked sufficient detail to conduct a full evaluation. Members suggested that EPA develop a more detailed project plan to provide more information about how it would be implemented. A member noted that it was important to identify ecosystem services in EPA's endpoint guidance document and to understand how the services should be valued. He noted that EPA's project plan did not clearly articulate how this would be accomplished. Another commented that the Risk Assessment Forum risk communication and ecosystem services projects should be linked.

Members discussed the use of case studies to illustrate how ecosystem services could be incorporated into ecological risk assessments. A member commented that developing ecological production functions could be costly. She indicated that it was important to clearly show (in case studies and the white paper) how production functions could be incorporated into ecological risk assessments. A member suggested that EPA consider using the issue of hypoxia in the Chesapeake Bay as a case example to show how to incorporate ecosystem services into a risk assessment. Committee members discussed other ongoing work that might be developed as case study examples. A member noted that the U.S. Forest Service often uses ecosystem services endpoints in its work. The Chair commented that members should mention specific examples and include citations in the Committee's report.

The Committee discussed EPA's proposed ecosystem services white paper. Members expressed support for developing the white paper and suggested that it might be useful to have the SAB review it when it is complete. A member suggested that a version of the white paper be published in a peer-reviewed journal to provide access to the larger scientific community.

The Chair thanked the members for their discussion of the response to charge question 5 and called for discussion of the response to charge question 6.

Discussion of the response to charge question #6

The Committee discussed the response to charge question 6, which focused on how EPA could use adaptive management for testing and revising risk management actions. A member commented that EPA's Ecological Assessment Action Plan had not provided a detailed description of the proposed use of adaptive management. He noted, however, that the National Research Council had identified the elements of adaptive management. He noted that many of these elements were common to the ecological risk assessment framework used by EPA. Another member expressed support for the use of monitoring to validate ecological risk assessments.

A member commented that the use of an adaptive management approach was resource intensive and that EPA did not have a mandate to apply this approach. He noted that the approach was useful but it would be difficult to implement. Another member agreed that implementation of adaptive management was a good idea but he commented that this would be difficult, given the complex problems and issues facing EPA. Another member indicated that in order to effectively use adaptive management it would be important to apply principles of rigorous statistical design. She commented that this would be difficult and expensive but very useful.

Several members offered additional comments on the need for ongoing monitoring. They noted that monitoring was extremely important. Members commented that risk assessment and management should not be static and that it was important to monitor outcomes and make appropriate changes.

The Chair then thanked the members for their comments and called for the discussion of the response to charge question 7.

Discussion of the response to charge question #7

The Committee discussed the response to charge question 7, which focused on how EPA could strengthen its ecological protection goals.

Members commented on the dichotomy between human health and ecosystem protection goals at EPA. They noted that human health protection appeared to receive greater emphasis in EPA programs.

Committee discussed how incorporation of ecosystem services into the ecological assessment process could be an effective strategy to strengthen the EPA's ecological protection goals. Members commented that an ecosystem services framework explicitly recognized the interdependence of ecosystem function and human health. Members suggested that to strengthen EPA's ecological protection goals, the ecosystem services framework could be expanded to include environmental justice which recognized that poor ecological conditions and/or health could exacerbate exposure and the magnitude of negative impacts on vulnerable populations.

A member commented that poor communication of the importance of ecosystem protection was one reason why EPA's ecological protection goals were not as strong as they could be.

Members commented that many of the risk assessment practices recommended in the 2007 SAB report on advancing the science and application of ecological risk assessment would lead to the development of more robust assessments and ultimately a better understanding and stronger protection of ecosystem structure and function.

The Chair thanked the members for their comments and asked them to next address the issue of prioritizing the recommendations in EPA's Ecological Assessment Action Plan.

Discussion of prioritizing recommendations in EPA's Ecological Assessment Action Plan

The Chair asked the Committee to discuss whether recommendations in EPA's Ecological Assessment Action Plan could be prioritized.

A member commented that it would be difficult to prioritize all of the recommended actions. He suggested that several of the relatively important recommendations could be identified.

Members discussed the recommendations and suggested that three of the initiatives in the Plan appeared to have the greatest likelihood of advancing the agency's goals in the near term. These three initiatives were: use of weight-of-evidence approaches in ecological risk assessments; improved communication of ecological assessment issues and results to decision-makers; and incorporation of ecosystem services into ecological risk assessment methods. The three initiatives were not ranked according to priority.

Action items and next steps

The Chair reviewed the action items and next steps to complete the Committee's advisory report. She indicated that the lead writers for each of the charge questions should develop the responses to their assigned questions and circulate them to the lead discussants for review. She indicated that the lead writers should send the responses to the charge questions to the DFO by Friday, March 16th.

The DFO would then work with the Chair to develop the first draft of the Committee's report. The draft report would then be sent to the Committee for review and the DFO would schedule a teleconference for the Committee to discuss the report. Following the teleconference, additional revisions would be incorporated into the report and it would be sent to the Committee for concurrence before it was transmitted to the chartered SAB for quality review. The DFO then

indicated that there were no additional agenda items to be discussed. He thanked Committee members for calling and adjourned the teleconference.

Respectfully Submitted:

Certified as Accurate:

/Signed

Dr. Thomas Armitage
Designated Federal Officer

/Signed/

Dr. Judith L Meyer, Acting Chair
SAB Ecological Processes and
Effects Committee

ATTACHMENT A: COMMITTEE ROSTER

U.S. Environmental Protection Agency Science Advisory Board (SAB) Ecological Processes and Effects Committee (EPEC) Augmented for Review of the Ecological Assessment Action Plan

CHAIR

Dr. Ingrid Burke, Director, Haub School and Ruckelshaus Institute of Environment and Natural Resources, University of Wyoming, Laramie, WY

EPEC MEMBERS

Dr. Ernest F Benfield, Professor of Ecology, Department of Biological Sciences, Virginia Tech, Blacksburg, VA

Dr. Peter Chapman, Principal and Senior Environmental Scientist, Environmental Sciences Group, Golder Associates Ltd, Burnaby, BC, Canada

Dr. Loveday Conquest, Professor, School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA

Dr. Richard Di Giulio, Professor, Nicholas School of the Environment, Duke University, Durham, NC

Dr. Robert Diaz, Professor, Department of Biological Sciences, Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA

Dr. Lucinda Johnson, Center Director, Center for Water and the Environment, Natural Resources Research Institute, University of Minnesota Duluth, Duluth, MN

Dr. Thomas W. La Point, Professor, Department of Biological Sciences, University of North Texas, Denton, TX

Dr. William Stubblefield, Senior Research Professor, Department of Molecular and Environmental Toxicology, Oregon State University, Corvallis, OR

SAB MEMBERS

Dr. Judith L. Meyer, Professor Emeritus, Odum School of Ecology, University of Georgia, Lopez Island, WA

Dr. Amanda Rodewald, Professor of Wildlife Ecology, School of Environment and Natural Resources, The Ohio State University, Columbus, OH

CONSULTANTS

Dr. Gregory Biddinger, Managing Director, Natural Land Management, Houston, TX

Dr. G. Allen Burton, Professor and Director, Cooperative Institute for Limnology and Ecosystems Research, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI

Dr. Wayne Landis, Professor and Director, Department of Environmental Toxicology, Institute of Environmental Toxicology, Huxley College of the Environment, Western Washington University, Bellingham, WA

SCIENCE ADVISORY BOARD STAFF

Dr. Thomas Armitage, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

The following meeting materials are available on the SAB website, <http://www.epa.gov/sab>, at the February 23, 2012 Ecological Processes and Effects Committee meeting page:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/784d0187422baa4085257989007c3e54!OpenDocument&Date=2012-02-23>

¹¹ Federal Register Notice

² Agenda

³ Charge to the Committee

⁴ EPA Review Documents

- Integrating Ecological Assessment and Decision-making at EPA, RAF Ecological Assessment Action Plan (August 11, 2011)
- RAF Ecological Risk Assessment Communication Technical Panel Workplan (May 2011)
- RAF Incorporating Ecosystem Services as Endpoints for Ecological Risk Assessments Technical Panel (August 2010)

⁵ EPA Provided Background Material

- Integrating Ecological Assessment and Decision-making at EPA: A Path Forward – Results of a Colloquium in Response to Science Advisory Board and National Research Council Recommendations

⁶ EPA Briefing Material

- Presentation by Anthony Maciorowski – “Strengthen Science Policies that Promote Agency-Wide Ecological Protection Goals”
- Presentation by Edward Ohanian and Lawrence Martin – “SAB/EPEC Review of EPA Ecological Assessment Action Plan”
- Presentation by Glenn Suter – “Integrated Risk Assessment Approach to Ecological Assessments”
- Presentation by Glenn Suter – “Science Policy and Technical Practice Initiatives in the Ecological Assessment Action Plan”
- Presentation by Glenn Suter – “Use of Adaptive Management to Test and Revise Management Actions”
- Presentation by Glenn Suter – “Use of the Weight of Evidence Approach in Ecological Risk Assessment”
- Presentation by Mace Barron – “Ecosystem Services as Assessment Endpoints in ERA: RAF Technical Panel”
- Presentation by Mary Reiley – “Enhancing the Use of Ecological Risk Assessment in Agency Decision making: RAF Technical Panel”

⁷ Preliminary Comments from Committee Members

- Preliminary comments from Committee members as of February 21, 2012
- Preliminary comments from Dr. Greg Biddinger
- Summary of the preliminary comments from Committee members in response to charge question 3 (prepared by Dr. Peter Chapman)

⁸ Public Comments Received

- Jean Public